

Gwladys Street Nursery and Primary School



Mathematics Policy

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Gwladys Street Nursery and Primary School

Mathematics Policy
Principles and Rationale

Vision Statement

To provide the stepping stones for a successful and fulfilling future with the Gwladys Street Family, celebrating generations of success.

Aims

We want our school to be one:

1. Where everyone has access to an engaging, creative and challenging curriculum that promotes a love of learning.
2. Where everyone feels safe, happy and secure in our learning community.
3. Where everyone works in partnership with the wider school community.
4. Where Golden Opportunities are provided in an Inclusive Setting.
5. Where everyone respects each other and works as a team to achieve our GOALS.
6. Where children develop lively, enquiring minds, self-confidence and independence.
7. Which promotes a healthy lifestyle and positive, spiritual and moral values.

At Gwladys Street Nursery and Primary School we aim to develop numerate children who are confident with number and understand mathematical calculations. We believe that Mathematics provides children with the essential life skills of;

- Understanding number and calculation,
- Problem solving,
- Enquiry,
- Reasoning Skills,

We aim to provide children with a fun but focussed Maths curriculum, providing the children with the skills to become equipped for adult life. We adopt a fully inclusive, mind-friendly approach to teaching and learning in Mathematics where children are challenged sufficiently in a supportive environment. Assessment for learning allows children and teachers to review the strategies and methods used in the lessons thus always moving learning on.

Golden Opportunities for Achievement and Learning

Aims:

- To develop numerate children who are fluent through the '*mastery approach*'.
- Ensure every child is confident, enthusiastic and are resilient when approaching increasingly complex Mathematical problems, so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Provide children with the skills to follow a line of enquiry, to use and apply Mathematics in different contexts
- Provide children with the vocabulary to talk about and explain Mathematical concepts and develop an argument, justification or proof using mathematical language
- Provide children with an exciting Maths curriculum which is embedded in real life situations and practical problem solving.
- Use ICT to enhance learning and teaching of Mathematics.
- Use a variety of learning styles and resources to cater for all children's needs.

Planning our Mathematics Curriculum

Mathematical Development is one of our primary focus points from the moment that our children enter our school. Children need to be able to recognise numbers, tell differences, add things together and recognise shapes, time, days of the week etc to be able to live and learn independently. We know that all aspects of learning in this area impact on our children's achievement across the curriculum.

At Gwladys Street Nursery and Primary School, we use Assessment for Learning strategies to ensure that our curriculum is designed to meet our children's needs. This has to be our starting point.

Our focus for Mathematics is ensuring that we constantly use opportunities in all areas of our curriculum to develop children's mathematical understanding.

Planning

At Gwladys Street Community Primary and Nursery School our children in the Foundation Stage receive a personalised curriculum designed around the Birth to Five revised Ages and Stages. Staff use 'Numbers and Patterns' to support and guide their planning.

In KS1 and KS2 the staff use School Improvement Liverpool's planning document to plan which follows the National Curriculum for Mathematics Statutory objectives. This document places the relevant learning domains into half term blocks.

At the beginning of the academic year the Mathematics Leader provides the staff with a detailed break down of areas of learning which have been identified as areas of development in the pupil's previous years optional SATs papers and school tracking systems. This is used to support the staff in creating a Mathematics curriculum that is tailored towards the needs of the children. At this point and throughout the year, provision is allocated to children needing additional support outside the classroom. However, 1st class teaching is always the main priority.

The openness of the planning allows staff to easily link learning into our curriculum, making relevant links to our Creative curriculum topics, when those opportunities present themselves. However, we do recognise the importance of the National Curriculum Programme of Study for Mathematics and the staff must ensure that there is coverage and progression by cross referencing the

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points of study. Once an area has been taught, the staff will be required to highlight and date the LA planning document. This is then passed onto the next class teacher at the end of the academic year to support their planning. It is absolutely vital, that we plan our mathematical learning in this way to ensure we narrow the gap for all groups.

Teacher's planning in Mathematics should contain:

- clear learning intentions (WALT), that have a clear learning focus.
- explicit steps to success that support children to achieve the learning intention.
- clear differentiation with SEN children identified.
- Identified models and images which are to be taught - highlighted in a different colour.
- opportunities for talking maths - Cooperative learning styles should be highlighted in planning in a different colour.
- A balance between learning and teaching.
- opportunities for real life problem solving.
- Opportunities for enquiry based activities to show deeper learning.
- clear mini plenaries which consolidate learning as well as move learning forward.
- Focus groups identified for the member of staff to work with daily.
- Support staff linked to a focus group.
- Challenge through investigations to broaden the children's understanding.
- progression through the area of mathematics.
- evaluations through annotations to inform next steps.

Weekly planning should be added to the learning wall.

In **KS1** planning is based around:

- 5 daily mathematics lessons, including at least 1 Maths of the Day lesson.
- 15 minutes daily for developing age appropriate mental mathematics skills through the planning and delivery of Maths-Magician Passports.
- Regular opportunities for 'real life' problem solving using RUCSAC and the Singapore bar method to support learning as a starting point moving to more complex word problems. At this point highlighters or underlining is to be used to identify key parts of the question.

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→ Using ICT to develop understanding.

In **KS2** planning is based around:

- 5 daily mathematics lessons, including at least 1 Maths of the Day lesson.
- 15 minutes daily for developing age appropriate mental mathematics skills through the planning and delivery of Maths-Magician Passports.
- Regular opportunities for 'real life' problem solving moving away from RUCSAC using resources like the Singapore bare method. At this point highlighters or underlining is to be used to identify key parts of the question moving onto underlining of key parts in KS2.
- Using ICT to develop understanding.

Daily Mathematics lesson.

In most cases this will adhere to the structure of a typical maths lesson which will include a mental and oral starter linked to a main lesson linked to a plenary. The objective should be picked from the Liverpool Authority scheme of work. All work in the lesson should link to this objective. Teaching should follow the school calculation policy which is staged not aged.

During the teaching of the objective Mental and Oral starters should include some counting, recall of facts, i.e. bonds, tables, deriving facts, reasoning, application and open ended questions. A variety of teaching styles should be used over the course of the week (VAK). Cooperative learning styles should be include, e.g. pair, group etc.

Differentiation should be evidenced through questioning, resources, scaffolding, models and images and additional support.

The main teaching will include appropriate differentiated tasks that allows challenge for all levels of ability through reasoning and application.

Within each lesson, mini plenaries should be used as formative assessment to reinforce learning/ move learning on and address any misconceptions. Capturing progress is key and mini plenaries are a valuable way to assess and make key judgements on how to move learning on.

Plenaries are more than a bolt on lesson or a show and tell. It should provide opportunities to ensure that the pupils have grasped the objective and made progress so that the next lesson can begin on firm foundations. A plenary should

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confirm, extend and invigorate learning. It has to be about learning and not just consolidation.

At the end of the lesson Next Steps are introduced where the teacher can pose a question, show an image or set a task while allows the children to start thinking about the next day's learning.

Mind Friendly and Active Learning

Our Learning and Teaching policy states that children learn best when they are engaged and active participants in their learning. Mind-friendly learning gives teachers opportunities to challenge children's thinking in a non-threatening way, whilst embedding learning.

We recognise that Mathematics lessons should **not** be dominated by teacher talk. Children can be active using whiteboards, clocks, show me activities, talking partners, mind maps, flash cards, number fans etc.

Think Pair Share

Children should be given thinking time before answers are expected, opportunities to share ideas with a partner and then a group before feeding back to the class. This reinforces learning and develops speaking and listening skills. We believe that 'talking maths' strategies are essential if we are going to develop numerate children.

VAK

Opportunities should be created in mathematics teaching for children to experience visual, audio and kinaesthetic learning. Allowing children to learn in different ways improves understanding, enjoyment and retention of what is being taught. Audits of mathematical equipment are located in the staff drive.

Time for Reflection

It is paramount that children are given time to reflect on their learning at the end of every lesson. Rather than being a time to show examples of good work, children should be given a range of ways to reflect on their learning journey. This will help consolidate learning and highlight misconceptions. Reflection time should involve the whole class through activities such as - donut; hot seat; snowball; post its; networking. Children need to be explicit about their leaning in Mathematics.

Calculation Policy

At Gwladys Street Community Primary and Nursery School the staff agreed to follow the progression of written calculations detailed in our Calculation Policy at a staff meeting in January 2015. The policy is located on the staff drive.

The essential components of the Calculation Strategy are;

- **Children's mathematical development should be progressive and structured**
- **In all lessons children should be taught a core strategy.**

At Gwladys Street Community Primary and Nursery School, we recognise the importance for an emphasis on Mental Maths. Thus the policy contains Stages to follow which are related to written calculations. However, we must ensure that children reach and are using formal method for all operations by the end of year 4.

At Gwladys Street Community Primary and Nursery School, we have developed a mental mathematics passport scheme with a reward system built in.

Written calculations are also arranged into Stages. Children will move to the next stage in written calculations, only when they are ready and this process should not be rushed. **However the expectation is that by the end of year 4, children are using the efficient method for addition, subtraction, multiplication and division.**

Termly assessments and teachers' professional judgements will inform when a child is proficient in one method and ready to be challenged by the next step.

It is important to stress that when using the Calculation Policy

- Children will be encouraged to approximate their answers before calculating.
- Children will be encouraged to check their answers after calculations are made.
- Children will be encouraged to consider if a mental calculation is appropriate before using written calculations.

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Problem Solving

All teaching staff have been trained in using the 'Bar Model' approach to problem solving and it is expected that children are taught how to solve problems through this method.

Children will begin developing their understanding of this approach through practical activities using Cuisenaire rods progressing to representing problems through diagrams.

Maths of the Day

Teachers plan at least 1 lesson per week. Maths of the Day is an innovative and creative online resource providing lesson plans for 'Active Maths' linked to the National Curriculum which brings together Mathematical learning and PE. Its main focus is in developing fluency through number and is an engaging and exciting way to deliver Mathematics and PE.

Assessment

At the beginning and end of each academic year, each year group sits a GL Mathematics assessment which includes a mental maths section. This is used to inform the class teacher of where each child is in terms of age related expectations and places the children into groups, identifying strengths and weaknesses. This should support learning and teaching by informing planning.

Pre and post assessments are carried out at the beginning of each domain and used to target teaching to address areas of weakness. Teachers use this to identify what the children can do and what they need to do to move their learning forward. All children receive individual targets at the beginning of the domain. These targets are revisited at the beginning of each lesson.

Children's ability based on their understanding of daily WALTs linked to the National Curriculum is recorded on Otrack on a regular basis to create a picture of each child and the cohorts learning. Where underperformance is identified additional support through guided groups should be planned and tailor made interventions put into place to support children's understanding.

Number (Place value, addition and subtraction, multiplication and division and fractions), measurement, geometry and statistics should all be assessed throughout the year.

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Every week children are given a Mental Maths assessment from the Rising Stars scheme. Staff should mark and record the results weekly and use this to inform their planning and teaching. The results are collected by the Basic Skills Teacher and are monitored and tracked. Additional support is provided when needed to staff. Children also complete a Times Table test (differentiated to support the expectations of each year group linked to the National Curriculum expectations)

At Gwladys Street Community Primary and Nursery School we believe that formative assessment is fundamental to the success of our learning and teaching strategies. We want our children to be active participants in their assessment and to value the next steps in their learning.

Marking and Feedback

Throughout lessons, teachers will work with a guided group, providing them with instant verbal feedback to ensure this group makes rapid progress within the lesson.

At the end of the lesson, the teacher will mark the child's work following the schools Marking and Feedback Policy and **MUST** include at least **ONE** next steps mark to ensure that children's learning is moved forward. Staff can also include throughout the week, especially if a child has not achieved their WALT, scaffolding support, consolidation or challenges.

In lesson's, it is also important and vital to allow children to peer assess their work to develop deeper Mathematical understanding. However, this should be checked, corrected and marked by the teacher after the session.

Assessment for Learning

Assessment for Learning should be an integral part of all Mathematics teaching. Every lesson should have a clear and child friendly learning intention (WALT) "we are learning to..." as well as a differentiated list of success criteria or steps to success.

Where possible, children should be involved in writing the steps to success and explain their choices. Children should routinely refer to the steps to success throughout the lesson to ensure success in the lesson. Also the steps to success should be used for both self and peer assessment. The children should be able to identify strengths and ways forward in order to become more independent learners.

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Children should also be given opportunities to self assess through talk, the use of thumbs up and by stamping their work using the self-assessment stamp on their work.

All self and peer assessment must then be carefully observed by the teacher and future teaching and learning adapted accordingly.

Mathematics Targets

Children are set personal targets in Mathematics at the beginning of each domain. These should be identified on the pre assessment sheet using the marking policies 'target' symbol. Teachers should refer children to the children's targets and ensure frequent opportunities are planned in order to support children in reaching their targets.

Math-Magician passports (Carlos the Calculator)

At Gwladys Street Community Primary and Nursery, we use passports to support the children's learning of basic skills in Mathematics. Age appropriate passports are given to each child at the beginning of each year. However, SEND children can begin on passports which support their needs. The passport targets are broken into *Bronze, Silver and Gold*. Each child has to achieve each target over the period of a year. Their understanding is assessed throughout the year to check it is secure. Children are rewarded at the end of each coloured section with the appropriate coloured star pin badge. When a child finishes the passport they are working on they then must demonstrate their understanding through investigations.

Staff plan a 15 minute daily basic skills lesson where the staff model and demonstrate the learning objective that is matched to the basic skills target from the passports. Children are then given the opportunity to work in pairs and teams to practice their targets in a fun and interactive way. Staff must work with a guided group daily to model, consolidate and move learning forward.

Passports progress from F1 to Year 6 and develop children's skills in Number recognition, number bonds, multiplication and division facts.

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Additional Needs Provision

Children may benefit from being provided with Mathematics intervention through tailored support. These children will be added to the Provision map if they are making little progress; they are off track to meet predictions or if they have a specific learning difficulty.

Maths SEN Interventions

Spring Board Mathematics

Wave 3 Mathematics

Basic Skills Interventions

Picture Maths

It is dependent on LSA resources and pupil needs as to whether all or some of these interventions are run.

Also refer to the INCLUSION AND SPECIAL EDUCATIONAL NEEDS POLICY for further guidance.

Mathematics and ICT

ICT is an excellent way to inspire and interest children in Mathematics. SMART boards should be used to model and stimulate learning. Interesting images can be used as an inspiring way to get children thinking about, talking about, reasoning, explaining and ultimately solving Mathematical problems.

All classes have access to ipads, laptops and other ICT equipment and this is an ideal opportunity for the children to practice their mathematical skills in a fun and stimulating way.

All staff have a "Using ICT to enhance Excellence and Enjoyment" booklet which catalogues the Mathematics ICT resources available in school and this can be used to aid planning.

Staff can also use a range of internet sites that provide fun but focussed learning in Mathematics such as **RM easimaths** and **Mathletics**. (see Appendix1)

Home Learning

At Gwladys Street Community Primary and Nursery School we understand the need to support parents with home learning. Support can be found on the school website <http://www.gwladysstreet.org/mathematics/>. In addition to this, the school is also committed to providing regular opportunities for family learning sessions about mathematics in school.

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Children are given one piece of home learning each week. This is set by the class teacher and is in the form of an activity or project that will consolidate the learning that has been happening in school.

Differentiated Home learning can also be accessed through **RM Easimaths** <http://www.rmeasimaths.com/> (Foundation Stage and Key Stage 1) and **Mathletics** <http://www.mathletics.co.uk/> (Key Stage 2) where children take part in fun activities which are designed to support and move their learning forward. Children are rewarded through certificates of achievement in weekly celebration assemblies.

Resources

All practical resources are catalogued and located in the Maths areas in the staff room. Only adults are permitted to collect and return resources and are expected to return resources back to their boxes, shelves etc... A list of catalogued resources is given to all members of staff to aid with planning. This is stored on the staff drive.

All classrooms have a useful area where children can access a wide range of resources to support them in their learning. Teachers should model the use of this area and encourage children to access it when needed.

Each classroom also has an Estimation Station to support the children in the vital skill of estimation.

Learning Walls

Purpose of working walls

The learning environment that is provided for children can have a huge impact upon their learning and independence. Changing the emphasis of the content of the display can support the children in their day to day and longer term learning.

The term 'working wall' is used to describe displays which support children's learning during specific domains of work.

The content of a working wall should change regularly to support learning and teaching as it develops in the classroom. The ultimate aim is for children to access prior learning, make links to what they already know and apply this to future learning.

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A working wall enables children to refer models and images, to concepts and resources, supporting them to become more secure independent learners. It is the public display of the learning process. It is important for long term learning objectives and short term intentions to be displayed on the working wall. When success criteria are appropriate they are developed with the children and clearly displayed on the wall, demonstrating to pupils how they will be able to achieve the agreed learning intention.

Key vocabulary for that domain should be clearly displayed on the wall to support children's learning.

Teachers weekly planning should be added to the learning wall.

Mathematic Progression walls

In each Key Stage hall we have a progression wall. This wall is changed throughout the year and reflects school priorities identified during regular data collection.

Children produce work within Mathematics or cross curricular lesson with a set focus. Staff then choose a selection of work which reflects Age Related Expectations. This work is displayed with 2 speech bubbles, one from the teacher identifying the specific areas covered and what the child did well. The other from the child explaining what they achieved and enjoyed.

Mathematics through the IPC curriculum

Staff should plan appropriate opportunities linked to the age expectations in the IPC curriculum allowing children to apply skills learnt in Mathematics lessons.

Please also read this policy in conjunction with;

- Marking and Feedback Policy
- Calculation Policy

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- Appendix 1

This website is useful for everyone.

A great multiplication game. This will help with EVERYONE'S tables!

<http://www.primarygames.co.uk/PG5/Eggs/Multi/eggsmult.html>

This one is division

<http://www.primarygames.co.uk/PG5/Eggs/Div/eggsdiv.html>

Fraction freeze:

<http://www.primarygames.co.uk/PG5/Fraction/freeze.html>

Another football game - follow the instructions carefully:

<http://www.funbrain.com/fractop/index.html>

Different topics:

<http://www.rainforestmaths.com>

<http://www.mathszone.co.uk>

Other Activities can be found on:

<http://www.gwladystreet.org/special/maths/>